

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Petition of American Hotel & Lodging
Association, Marriott International, Inc., and
Ryman Hospitality Properties for a Declaratory
Ruling to Interpret 47 U.S.C. § 333, or, in the
Alternative, for Rulemaking

RM-11737

Comments of
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I have been a radio amateur licensed by the FCC since 1957, when I was 12 years old. In 1959 I first learned how to program a digital computer. I have been working with computers ever since and am co-author of The Internet For Dummies Quick Reference and E-mail For Dummies. I hope my perspective will be helpful to the Commission in this matter.

A basic understanding taught me by my mentors was that the radio spectrum was a shared resource and that all its users were required to avoid harmful interference. I spent many hours in my youth installing interference filters on my neighbors' television sets, even though my operation was fully licensed and the interference they suffered was due to the inadequate design of their receivers. The ethos of sharing was central to the radio communication industry in those days.

Those who wish exclusive use of spectrum can buy some

Since that time the FCC has sold segments of the radio spectrum at auction for billions of dollars. Those who wish to enjoy the benefits of exclusive spectrum ownership can purchase some frequency bands at those auctions or buy or lease spectrum on the secondary market. However the FCC has wisely kept some small portions of the spectrum out of these auctions and opened them for general, unlicensed use by the public under Part 15 rules.

The availability of this unlicensed public use spectrum has spawned a myriad of devices that have proven wildly popular. As everyone who has read the fine print accompanying these devices knows, such devices must not cause harmful interference and must accept any interference received. In other words, in exchange for not having to buy your own spectrum, you are subject to the same ethos

of sharing I was taught in the 1950s, which goes back to the earliest days of radio.

Petitioners and their supporters now want to enjoy the benefit of exclusive spectrum ownership without paying for it. It would be completely unfair to both the industries that have purchased spectrum and the industries that have invested heavily in designing and marketing Part 15 devices to allow such free-riding. If the hotel industry and its allies wish to provide exclusive wireless services on their properties, let them join together and purchase the spectrum needed. That they would then face the expense of developing and deploying suitable radio interfaces only underlines the free-riding nature of their proposal.

Unlicensed devices have long been protected under Section 333

The FCC established the Citizens Radio service shortly after World War II. While Citizens Band radios initially required individual licenses, this requirement was later dropped. Other unlicensed radio services currently in use include the Family Radio Service (FRS) and Multi-Use Radio Service.

It is beyond question that these services are covered by Section 333. Here, for example, is a link to a 1986 New York Times article on a crackdown by the FCC on Citizen Band interference caused by illegal power boosters: <http://www.nytimes.com/1986/03/11/arts/us-in-crackdown-on-citizens-band-interference.html> I'm sure the files of the FCC contain other examples of anti-interference enforcement actions for these unlicensed services. Would the FCC allow resort operators to jam FRS radios brought in by guests so that the resorts could rent out their own walkie-talkie radios? I think not.

"Interfere with" has always been understood broadly

I vividly remember when transistor radios first came on the market. They were amazing. The most common models had six transistors and could fit in your pocket. The radio in my pocket now, an iPhone 6, has over one trillion transistors. Section 333 of the Communications Act was written before any of this progress occurred. Yet its broad language has protected each new innovation in radio spectrum use as it emerged.

In the early days of radio, interference might be caused by an under-quenched spark gap, In continuous wave (CW) telegraphy, splatter from poorly shaped dots and dashes caused adjacent signal interference. Single sideband (SSB) radios, invented in the 1950s, caused interference if the unwanted sideband was inadequately suppressed. Microwave relay systems can cause interference if their antennas radiate excessively in unwanted side lobes. A geosynchronous satellite can cause interference if its orbital position drifts too close to another satellite. The nature of interference keeps changing as technology progresses, but the FCC has never failed to recognize it for what it is.

Wi-Fi protocols are similar to Morse Code network operation

Petitioners and their supporters argue that transmitting de-authentication frames is distinct from signal jamming and therefore is not covered by Section 333. An understanding of the manual telegraphy networks in common use in the 1930s when

the Communications Act was written refutes such claims.

There are strong similarities between IEEE 802.11 Wi-Fi signaling protocols and the protocols used in Morse Code radio traffic networks that were then widely employed to pass telegraphic message traffic. This similarity is no coincidence. Many of the designers of Ethernet and wireless networking were radio amateurs and found solutions to the problems of peer-to-peer networking in the old Morse radio network protocols. Technical issues like sharing frequencies, accepting connections from new stations without prior provisioning and dealing with more than one station transmitting at the same time are all familiar to Morse radio operators and the designers of Wi-Fi found parallel solutions. Call signs are similar to IP addresses. Net control stations are similar to access points. Three letter codes starting with the letter Q were standardized internationally and used to control the networks, much like 802.11 control frames.

Anyone who was privileged to operate on such networks remembers how disciplined they were and how busy and demanding they could be, with stations waiting their turn to send important messages often under difficult propagation conditions. Sending a malicious Q-code on the net control frequency could easily disrupt a network even if it was sent at normal power and at a time when no one else was transmitting. For example the code QRT would tell all stations to stop transmitting, somewhat analogous to a Wi-Fi de-authentication signal. QSY 25 would tell other stations to retune to a frequency 25 kHz higher. QRU told a station there was no traffic waiting for them. QSV said send a test pattern, and so on.

Transmitting misleading Q-codes on a network with the intent to disrupt operations would surely have been considered a violation of Section 333 at the time it was written. In the 1930s, transoceanic transport was almost entirely by ship and sending telegrams to and from ships was a lucrative business, with several large land operators competing for this ship to shore traffic. The temptation for an operator on one service to sabotage another network was real and well understood by the drafters of the 1934 Communications Act.

At the same time, someone sending the same Q-codes as part of normal network operation would not have been in violation. The distinction is clear from the first words of Section 333 “No person shall willfully or maliciously interfere with ...” Much as Q-codes were used to negotiate the use of shared frequencies, even among operators who did not understand each others spoken language, so too may de-authentication and other Wi-Fi control frames be used to facilitate orderly sharing of the public use spectrum. However they may not be used to “willfully or maliciously interfere with” the operation of a competing network.

Future uses must be protected

There is another interest to consider, the future of personal electronics. A major emerging trend in the consumer electronics industry is wearable devices. These include smart watches, fitness bracelets, devices for tracking children and pets, and a variety of medical monitoring devices currently under development or awaiting FDA approval. Almost all are designed to communicate with cellphones and each other via

personal networks operating on Part 15 wireless spectrum. Petitioners and their supporters want the right to control all Part 15 devices located on their property. If granted, presumably other property owners will assert the same right, making the personal networks we will soon be carrying and depending upon subject to failure every time we enter a strange building or walk nearby one. This could strangle the emerging wearables market and is not in the public interest.

Conclusion

The subject petition must be denied. It is nothing more than an attempt by one industry to charge rents for public-use spectrum they have not purchased and for technology others have developed with an expectation of unfettered availability. On the other hand, use of 802.11 signaling frames to manage shared spectrum (as opposed to monopolizing it) requires no reinterpretation of Section 333, as such legitimate use is similar to well-known signaling methods employed on Morse Code radio traffic nets when the Communications Act was enacted.

Respectfully submitted,

Arnold Reinhold